

A . P . E .

Automated Production Equipment Corp.



**SRS-069 PLATE MASTER
QUICK PLATE MANUAL**

INTRODUCTION

The Quick Plate System allows you to clean and electroplate printed circuit boards and electronic assemblies. Standard supplies include gold solution, nickel solution and electroclean. Available optionally are tin, lead, copper and nickel-plating solutions. See plating supplies replacement parts in this manual for part numbers and ordering information.

The SRS 069 has both a voltage and current control, is microprocessor controlled which automatically adjusts voltage and current control for depletion in solution, for military specification plating.

The Quick Plate SRS-069 is a low power system. The control circuit is a precision voltage source where the output voltage controls the activation of the plating solution. This voltage is controlled to greater than three percent by the internal regulator.

The current control on the SRS-069 determines the rate and the amount of plating that is deposited. The current control is a precision current source that insures uniform plating and when set, will not allow burning or arcing. The precision current source uses a high gain operational amplifier integrated circuit. The current control setting changes the gain of the difference amplifier and when the setting and current are the same, the amplifier controls the regulator from supplying any more current.

The SRS-069 has an instruction sticker mounted on the top of the machine for quick reference during use. Power Settings for the SRS-069 can also be found on Page 3.

OPERATION SPECIFICATIONS

Power Required: 115 Volts, AC, 60 HZ, 1 amp, or 220 Volts, AC, 60 HZ, 5 amp

Variable Current
Variable Voltage } **069 only**

Mechanical Parameters: 8" x 7" x 5"

Weight: 3 pounds

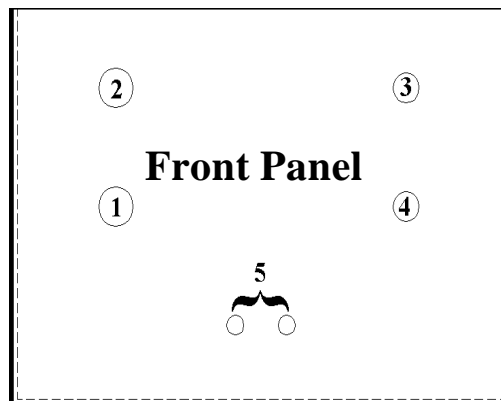
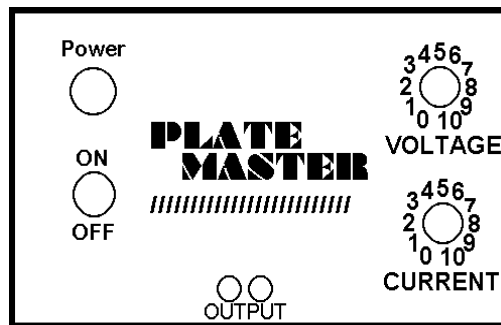
Corrosion-Proof Aluminum

MODEL SRS-069

NOMENCLATURE

SRS-069

- 1) On/Off Switch
- 2) Light (power)
- 3) Voltage Control
- 4) Current Control
- 5) Output



GOLD PLATING

1. **REMOVE ALL SOLDER FROM THE SURFACE TO BARE METAL.**
2. **FOLLOW VOLTAGE SETTING OR THE YELLOW STICKER ON COVER. (OR BELOW).**
3. **USE ONE BRUSH FOR GOLD, A SECOND BRUSH FOR NICKEL, A THIRD BRUSH FOR ELECTROCLEAN. DO NOT MIX BRUSHES.**
4. **SURFACE MUST BE CLEAN, DRY AND POLISHED BEFORE ANY APPLICATION.**
5. **REVERSE POLARITY FOR ELECTROCLEAN APPLICATION. (RED TO BLACK, BLACK TO RED)**
6. **THOROUGHLY DRY BEFORE APPLYING NICKEL, CHANGE POLARITY; RED-TO-RED, BLACK-TO-BLACK.**
7. **THOROUGHLY DRY BEFORE APPLYING GOLD SOLUTION.**
8. **BUFF ANY CLOUDED SURFACE TO A SHINE BEFORE ANY APPLICATION.**
9. **CLEAN AND DRY ALL BRUSHES AFTER WORK IS COMPLETED.**

SRS 069

QUICK PLATE SYSTEM

PN #0690-0000

INSTRUCTIONS:

Step 1: Clean Surface 2: Electro-clean 3: Distilled Water Rinse 4:Plate (See Settings)

POWER SETTINGS

VOLTAGE CURRENT

(GOLD ON COPPER)

1. Electroclean	4	5
2. Nickel	7	4
3. Gold	6	4

(GOLD ON STAINLESS)

1. Electroclean	4	5
2. Gold	6	4

(GOLD ON NICKEL)*

1. Electroclean	4	5
2. Gold	6	4

**Used for Most Jewelry*

Use the following P/N for Replacement Supplies:

DESCRIPTION	QTY.	P/N
Electroclean	1 oz.	6911-1321
Gold	1 oz.	6911-1336
Gold	3 oz.	6911-3336
Nickel	1 oz.	6911-1330
Copper	1 oz.	6911-1324
Copper Alkaline	1 oz.	6911-1326
Replacement Brushes	3 ea.	6911-0823
Brush Holding Screws	2 ea.	3028-3029

INITIAL SET UP

Set the controls on the Power source as follows:

1. Arrange a suitable workspace for chemicals and apparatus.
2. Voltage control to zero.
3. Current control to zero.
4. Distilled water in Squeeze bottle. *
5. See Plating Preparation Procedure in this manual prior to starting plating.
6. Note setting sticker mounted to machine outlining proper voltage and current settings.

**Note: Tap water should not be used. Iron or any other minerals in tap water can contaminate the surface or the plating solutions.*

GENERAL PLATING PROCEDURE

1. If there are solder splashes on the surface to be plated, they must be removed prior to the plating procedure. (See Pages 13 and 14 for clean-up procedure.)
2. In all cases, after thoroughly cleaning the work surface, the preliminary step is to clean the area with the Electro-cleaning solution provided. This should be done for the number of seconds and voltage called for in the Plating Preparation description, which follows.
3. Between each plating step, use the water wash bottle supplied (distilled water is required). When going through two or three steps in a plating sequence, use the water wash between each step to clean off previous solution as well as to prevent dry off between steps, which cause failure of deposit. When working with the brush and solutions, you can dip directly into the solution containers with the brush. **Be sure that the anode and brush are used for one solution only so as not to contaminate other solutions.** Remember to remove each brush not in use to avoid mix-ups. When brushing the work surface with plating solution, keep the brush saturated and work over a drip tray and not over solution containers, thus avoiding contamination and maintaining a clean work area. Drying off the workpiece after plating can be done with paper towels or tissue.

PLATING PREPARATION

Copper, Beryllium Copper and Brass

- a. Clean the surface per General Preparation.
- b. Electro-clean using Electro-cleaning solution at the power settings indicated on Pg. 3 for 3 to 5 seconds. This should remove light tarnish and oils. Rinse thoroughly.
- c. Brush surface with the solution being plated (excluding silver) before the current is connected.
- d. Electro-plate the surface per the plating solution instructions. (An under plate of nickel is used in most cases.) Rinse dry.

Aluminum

- a. Clean the surfaces per General Preparation.
- b. Electro-clean as previously outlined for 3 to 5 seconds. This should remove light tarnish and oils. Rinse thoroughly.
- c. Prior to plating any aluminum, preplate aluminum with a base of copper alkaline as outlined in Page 8.
- d. Brush surface with the solution being plated (excluding silver) before the current is connected.
- e. Electro-plate the surface per the plating solution instructions. (An under plate of nickel is used in most cases.) Rinse and dry.

PLATING SOLUTION USE

Caution: Plating solutions are water-based solutions and with the exception of gold, contain no irritating chemicals. Good industrial practice requires care to be taken so that no solution is splashed in or near the eyes. Hands should be washed thoroughly and at frequent intervals to avoid carrying residual solution to the mouth and to prevent prolonged skin contact.

Electro Clean

After preparing board for platings as outlined in preparation section of this manual under plating preparation, proceed as follows:

1. It is good general practice to electro-clean all areas to be plated to insure a good bond of metals and surfaces. Set controls as indicated on page 3.
2. Secure plating brush into probe and dip brush into electro-clean solution. With plating brush saturated with solution, gently rub area to be cleaned.
3. Take grounding probe (thin pointed metal probe) and touch to circuit to be cleaned.
4. Prior to subsequent plating operations, all areas must be thoroughly rinsed with **distilled** water.

Power Settings - See Page 3-

Nickel Plating

The nickel solution is primarily used for underplating in thickness of approximately .0003” - .0005” between a base copper surface and an overplate of gold. It may also be plated directly to mild steel.

Nickel Plating, cont'd.

Nickel-acid	6911-1330
Deposition Rate	.0006"/minute
Ave. Time (in sec.) to Deposit .0001	10

In plating nickel acid on all basic metals except aluminum, the surface should be first wet with the solution before applying power to the brush

Power Settings -See Page 3-

Copper

High Speed - This solution will give a rapid build-up of thickness which is its intended purpose. It should never be used directly on base materials but should be put over an underplate of .0003" - .0005" copper-alkaline. This material can be put directly over a base copper metal by first wetting the copper with the solution before applying power. This material can be used to fill or bridge small voids and will make satisfactory deposits of .0005" thick and over.

Copper - High Speed	6911-1324
Deposition Rate	.0010"/minute
Ave. Time (in sec.) to Deposit .0001	6

Alkaline - Copper Alkaline is ideally suited to under plating application on base aluminum surfaces. It is also used for thin copper build-ups of under .0005 in thickness (over .0005, use high copper speed). It may be plated directly to mild steel.

Copper, cont'd.

Copper - Alkaline	6911-1326
Deposition Rate	.0003"/minute
Ave. Time (in sec.) to Deposit .0001	20
Power Settings – Voltage 4; Current 8	

Tin - Lead Plating

Tin-lead alloy solder plating can be accomplished with the Power Source. Since the life of the tin-lead alloy solution is relatively short (approx. 4 hours) we have supplied the tin (alkaline) and lead as separate solution, which can be mixed in small batches as required to create the tin-lead alloy solution.

To create a 60/40 solder alloy for plating requires mixing 30% by volume of the lead solution with 70% by volume of the tin (alkaline) solution. To create a 50/50 solder alloy requires mixing 40% by volume of the lead solution with 60% by volume of the tin solution. This will provide a solder alloy of approximately 55/45, which is suitable for solder plating circuit boards and which can be applied directly to base copper materials.

Solder plating thickness for circuit boards should be .0002" to .0003".

Solder Alloy

Tin (Alkaline)	6911-1334
Lead	6911-1328
Deposition Rate	.0005"/minute
Ave. Time (in Seconds) to Deposit .0001	12
Power Settings – Voltage 8; Current 5	

Tin plating

This plating material offers excellent solderability characteristics and may be used as an under plate for tin-lead (solder) over plating or by itself to create solderable surfaces.

Tin (Alkaline)	6911-1334
Deposition Rate	.0005"/minute
Ave. Time (in sec.) to Deposit .0001	12

Power Settings – Voltage 8; Current 5

Gold Plating

Gold plating solution is ideally suited to printed circuit contacts as well as other electrical devices. It will provide corrosive resistance and a lubricating property to edge- connector fingers. It may also be used to great advantage on flexible circuitry and is useful in gold plating jewelry. For consistency of quality in plating copper and preventing copper migration through the gold, gold requires a nickel under plate. The gold plating thickness normally required for circuit board edge connectors is .0005" over a nickel under plate. (See nickel plating.)

Gold Plating cont'd.

Gold itself should not be used as an under plate flashing.

Gold	6911-1336
Deposition Rate	.0020"/minute
Ave. Time (in sec.) to Deposit .0001	3

Power Settings—See Page 3-

Tank Plating

Although we primarily cover the brush method of applying platings, there are many cases where plating specific parts is not adaptable to this method, due to the part's small size or configuration; i.e., terminals, eyelets, connector pins, etc.

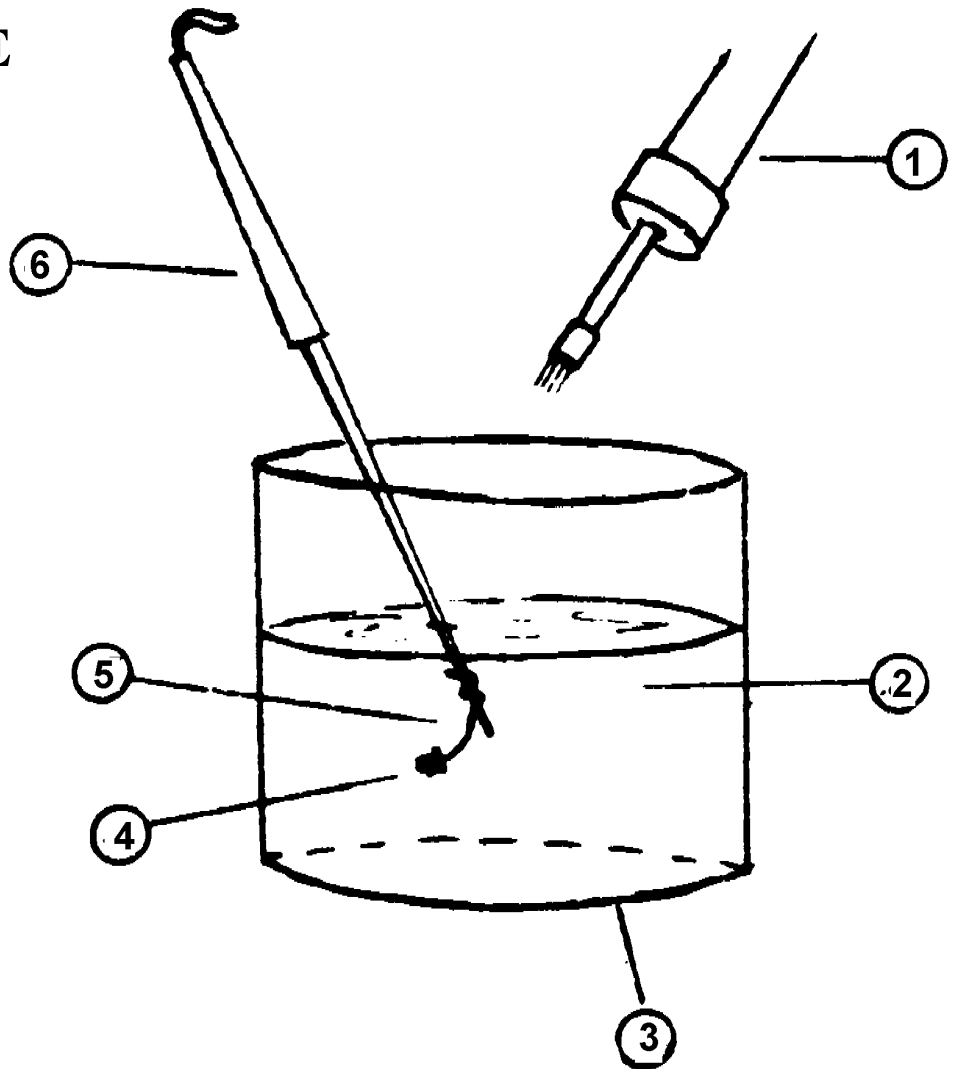
In these cases, tank plating can be the answer. The solution to be used is poured into a cup and the part itself (with a copper lead wire attached, which, in turn, is attached to the probe cathode) is immersed in the solution. The probe may now be placed in the cup beside the part and without touching it will cause a bath plating action to occur when the recommended voltage for the solution is applied.

TANK PLATING, cont'd

When completing a bath-type deposit, discard the plating solution remaining in the bath to avoid contaminating your main solution supply.

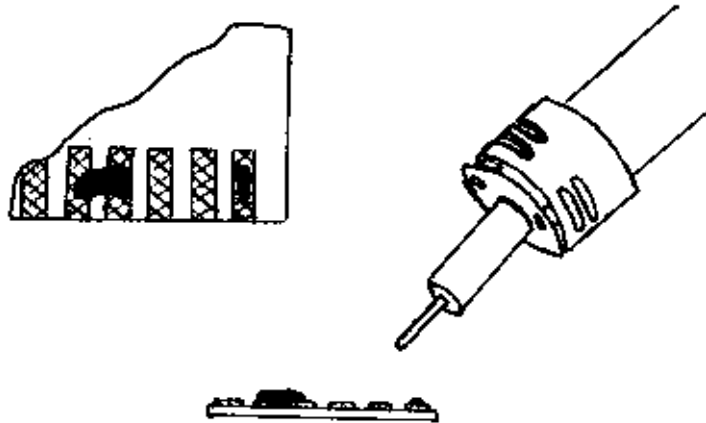
NOMENCLATURE

1. Brush anode
2. Plating Solution
3. Cup
4. Funnelet
5. Wire (cu)
6. Probe Cathode



PREPARATION OF CIRCUITRY PRIOR TO GOLD PLATING

CLEAN UP



SOLDER SPLASH

There are two procedures to remove solder splashes from circuit fingers.

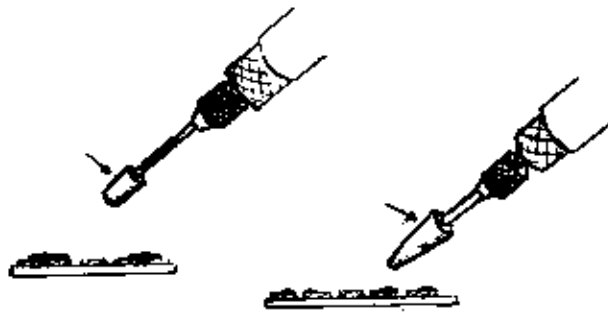
1. Solder Removal Using any of APE's desoldering handpieces, the solder can be heated and removed with no damage to the fingers.

APE's Miniature Machining Drill System can be used with the SRS-069. The Drill system is an optional accessory for the SRS-069.

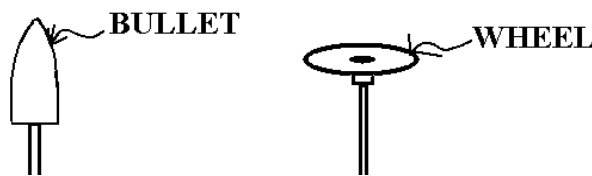
PREPARATION OF CIRCUITRY PRIOR TO GOLD PLATING CONT'D

MINIATURE MACHINING

1. To remove solder splashes on fingers using the APE Cirk grind tool, start with the conical stone to remove thick layers of solder.
2. Before the circuitry is uncovered, switch to the polishing abrasive tools.



3. Abrasives can be used to polish splashes prior to plating.
 - a. They come in coarse (green) and fine (brown) bullets and wheels.



4. The final preparation before plating is the fine polishing with the brown bullet.

PLATING SUPPLIES

ITEM NO.	DESCRIPTION	PART NO.
1.	Brushes	6911-0823
2.	Brush Holding Screws	3028-3029
3.	Probe Cord Set	4000-6182
4.	Rinse Bottle	6911-8899

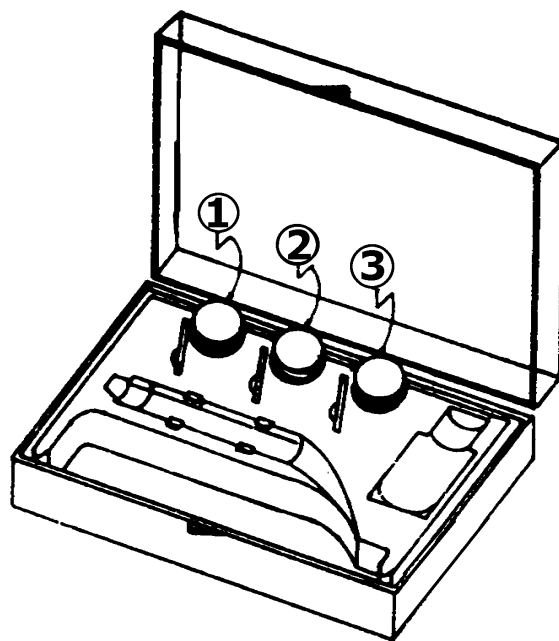
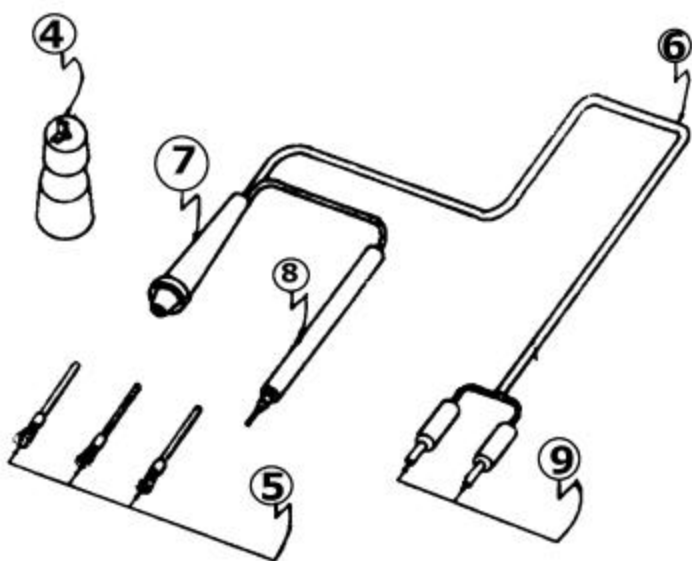
SOLUTIONS

1.	Electro-Clean	6911-1321
2.	Copper (High Speed)	6911-1324
3.	Copper (Alkaline)	6911-1326
4.	Lead	6911-1328
5.	Nickel	6911-1330
6.	Nickel (High Speed)	6911-1332
7.	Tin	6911-1334
8.	Gold 1 oz.	6911-1336
9.	Gold 3 oz.	6911-3336
10.	Silver	6911-1338

1.	Circuit Assembly	6905-0117
2.	Plate Cleaning Switch	5000-8017
3.	AC Line (110v)	4000-8402
	AC Line (220v)	8000-0100
4.	Light	5000-8014
5.	Output Plug	3505-0272
6.	Current/Volt. Control	3000-8460
7.	Transformer	4123-7302
8.	Probe cord Set	4000-6182
9.	Knob	3000-8004
10.	Probe Assy., w/Cord	4100-6100

QUICK PLATE KIT

PART NUMBER 0690-0002



NOMENCLATURE

ITEM

NO.	DESCRIPTION	PART NUMBER
1.	Gold Solution	6911-1336
2.	Nickel Solution	6911-1330
3.	Electroclean	6911-1321
4.	Rinse Bottle	6911-8899
5.	Plating Brushes	6911-0823
6.	Handle Assembly with Cord	4100-6100
7.	Brush Holder; Anode	Not Available Separately
8.	Probe; Cathode	Not Available Separately
9.	Plugs	Not Available Separately

NOTE: QUICK PLATE KIT (0690-0002) SHOWN ABOVE COMES WITH 1/2 OZ EACH OF GOLD, ELECTROCLEAN AND NICKEL SOLUTION.

1-888-DSOLDER TOLL FREE
NUMBER TO OBTAIN A COPY OF OUR
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AND REPAIR EQUIPMENT.

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NOTES:

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